All the phenomena of the warm and cold 'front' and of the 'warm sector' are observed. In the cold front, the phenomenon of the line-squall, with or without thunderstorms, is often well developed, and is a danger to aerial navigation, for the northerly or north-westerly wind may arise with the force of a gale. There is little doubt that the outflow of cold air from the Siberian high-pressure area tends, owing to the general configuration of the land around the Persian Gulf, to take a north-west to south-east trend from Iraq, and it readily concentrates into a violent inrushing wave of polar air behind a depression. An analogous effect is to be observed in the lower reaches of the Rhone valley, where we have the violent 'mistral'. As the western depressions of the Persian Gulf often advance from regions lacking in meteorological reporting stations, the onset of the dangerous cold front squalls can only be anticipated well in advance from the other frontal phenomena and pressure changes that normally precede it, which does not allow of accurate anticipation of the time of its arrival. Owing, however, to the fact that the ocean swell to which it gives rise travels more rapidly than the front itself, an 'eleventh hour' warning of a much more definite kind is obtained from the arrival in suitable circumstances of such a swell.

In summer, conditions are more complex and less definite. The Asiatic low-pressure system has a local extension south-westwards to Arabia, and variations in the intensity and position of the centre of this extension, which is often to be found over the south-east of Arabia, are liable to cause big changes of wind and weather over the Gulf and Mekran. When the local centre retreats to Persia or north-west India, north-westerly winds tend to invade the whole region, and may reach the force of a gale; but they will do so only gradually, and violent frontal squalls need not be feared at this season. At the height of the monsoon, when south-west winds have advanced across the Arabian Sea so as to penetrate Persia and Baluchistan, depressions may travel into those countries and winds from south-west or west may extend from Mekran over at least a part of the Gulf. Occasionally also depressions moving westwards from the Bay of Bengal affect this area. More often at this season there is a cyclonic circulation around the south-east of Arabia, the wind being southerly to easterly in Mekran and north-westerly in the Gulf.

Between the winter and summer regimes there are transitional periods, when, apart from local thunderstorms, dust storms, and other disturbances of convectional character, the weather is for the most part fine and quiet.

The effects of the various seasonal tendencies, outlined above, can be traced in the climatic tables towards the end of the work, and some individual storms are illustrated by synoptic charts and records of autographic instruments. Apart from its practical importance for flying, the work links up the better known climates of north-west India, Mesopotamia, and Upper Egypt in an instructive manner. Considered simply as climate, the heat and small amount of cloud revealed by the tables are the outstanding features of this region. Shade temperatures above 90° begin to appear so early as February, and 100° is often exceeded from March to October. In July, nearly all the stations have a mean night minimum above 80°, while at Bushire it averages 87°. Within the short period under review, 112° has been attained in more than one place. It must not be supposed that dry healthy heat is the rule, for, at the entrance to the Gulf, the wet bulb thermometer averages 85° in July. E. V. N.

The Origin of 'Mare Sporco'

MASSES of a yellowish or greenish-brown gelatinous substance floating at the surface of the sea and at times colouring large areas are the cause of the phenomenon known as 'mare sporco'. It is especially noticeable in the Adriatic, but may occur also in many other places. Numerous authorities have written on the subject, and Dr. Vito Zanon has reviewed the literature in the paper before us ("Esame di un campione di 'Mare Sporco' del Golfo di Fiume". *Memorie della Pont. Accademia delle scienze—i nuovi Lincei*. Series 2, vol. 15. 1931). His conclusions, based on his own observations, show that these curious masses in the water have their origin at the bottom where innumerable diatoms, usually a few definite bottom-living species, in certain circumstances by rapid reproduction give rise to a large amount of a gelatinous substance impregnated with much oxygen.

When the water is warm the bubbles of gas swell and the gelatinous masses, which are full of diatoms, and with them a good deal of oozy mud, rise to the surface, causing the water to appear a dirty yellowish or greenish colour. When it is colder, or when storms, winds, and waves are in action, the masses are scattered and descend again to the bottom. Great inconvenience is caused to the fishing nets, as the masses clog the meshes and sometimes break them with their weight. This condition may last a fortnight, during which time fishing may have to be abandoned.

The special sample from the Gulf of Fiume examined by Dr. Zanon was made up chiefly of the diatoms *Nitzschia Lorenziana* var. *subtilis* Gran, *Pleurosigma lineare* Gran, and probably *Nitzschia sigmoidea* W. Sm., but different diatoms may be the cause in other parts. Some authors found dinoflagellates and various planktonic forms. These, however, may have become entangled in the floating gelatinous mass and may not be its original cause. Schreiber found chiefly the diatom *Bacillaria paradoxa*, which lives epiphytically on *Zostera*, in the masses from the waters around Venice.

Dr. Zanon shows clearly that the phenomenon is not identical with those efflorescences in the sea which among many names given to them are known as 'red water' or 'yellow water'. These are caused by an enormous outburst of growth of certain planktonic organisms. The true 'mare sporco' is definitely caused by bottom diatoms in gelatinous masses, rising to the surface in the warmth and descending in the cold.

Ceremonial Games and Social Organisation among the Creek Indians

MR. JOHN R. SWANTON during the summer of 1929 visited the Creek country with the view of obtaining further information relating to the 'square grounds' or sacred areas in which the Creek Indians celebrate their busks and other annual ceremonies. His report is now published in *Smithsonian Miscellaneous Collections*, vol. 85, No. 8. The 'square grounds' are intimately connected with Creek ceremonial, social and political organisation. According to tradition, after the formation of the Creek confederacy, the Kasihta and Coweta, the two divisions of the Muskogee element in the Lower Creeks, who

lived on the river, now the boundary between Alabama and Georgia, having defeated all their enemies, instituted periodical ball-games as a kind of moral equivalent for war. As friendly relations were established with other Indians and they were admitted to the confederacy, they joined with one side or the other and the dual system became general, the Kasihta becoming known as the 'white' side and the Coweta as the 'red'.

In the ceremonial games four towns played on either side. There was a certain aloofness of the towns of one moiety from those of the other. They did not intermarry. The people of each town were divided into clans, each with an animal name; and certain of these clans were linked into phratries which, in theory at least, were exogamous. A further division links them as 'white' people and 'people of a different speech'. These are also said to be exogamous; but the principal function of this division seems to be to determine on which side the people should play in the town games.

Every town has a ceremonial ground in which there are three elements: a community hot-house, used in bad weather and for secret ceremonies, a 'square ground', and a 'chunky yard', so called from an old pastime which consisted in rolling a disc along a level plot and throwing poles at it. In the centre of this yard is a single pole with a cow, a horse skull, or a wooden figure on it. Around this the men and women play a kind of ball-game.

In the ceremonial games, which resemble our lacrosse, and are solemn affairs, only the men play. On the 'square ground' are performed the 'stomp-dances', of which three or four take place in the spring and early summer. Only members of the town take part. They lead up to the great annual ritual, lasting four days, in which prominent features are the woman's dance and the fast and ceremonial bath of the men. This is a ceremony by which the Creeks clearly believe that they return to the state of harmony with the spirit of Nature which has been ruptured by the profane acts of the preceding year.

University and Educational Intelligence

CAMBRIDGE.—An appointment is to be made this year to a Busk studentship in aeronautics. The studentship is of the value of about £150, tenable for one year, and is open to any man or woman being a British subject and of British descent who has not attained the age of twenty-five years on Oct. 1 next. Forms of application for the studentship can be obtained from Prof. B. Melvill Jones, Engineering Laboratory, Cambridge, and must be filled up and returned to him not later than May 12.

Prof. Albert Einstein will deliver the lecture on Mr. Rouse Ball's Foundation on Friday, May 6, at noon. The subject of the lecture will be "Die Theorie der Elektrizität im Rahmen der allgemeinen Relativitätstheorie".

LONDON.—Applications are invited for the Bayliss-Starling Memorial Scholarship (value about £120 per annum and exemption from tuition fees) at University College. The successful candidate will be required to follow a course of study approved by the Jodrell professor of physiology and involving a training in the principle of and methods of research in physiology and biochemistry. Applications must be received not later than May 14 by the Secretary, University College, Gower Street, W.C.1.

MANCHESTER.—The Manchester City Council is again offering a number of scholarships tenable in the Faculty of Technology of the University. Successful candidates are required to follow a full-time course leading to the degree of bachelor of technical science in the College of Technology, and matriculation or its equivalent is an essential qualification. For students who have been engaged in industry, and who have attended part-time day or evening classes, the scholarships are of the value of £100 a year, while for students leaving secondary or central schools the value is £60.

Calendar of Geographical Exploration

May 1, 1607.—Hudson's Voyages

Henry Hudson left Gravesend on his first voyage of arctic exploration, hoping that it might be possible to find a passage right across the polar area. He sighted the east coast of Greenland north of any previous point reached, and by following the ice barrier which extends between Greenland and Spitsbergen, proved that there was little chance of finding a passage through. On a second voyage he reached Novaya Zemlya and made several landings, but failed to penetrate to the Kara Sea. In his next voyage (1609), the ice proving unfavourable for the Novaya Zemlya region, he decided to search for a passage on the American coast, and there discovered the Hudson river. In 1610 he set out in the *Discovery* and passed through Hudson Strait to Hudson Bay. In the latter the ship was frozen in, and the party passed the winter in great distress and scarcity of food. A mutiny broke out, and Hudson and those who supported him were put in an open boat and left to their fate, the mutineers sailing home in the *Discovery*. The strait and bay named after him were probably known to the Portuguese in the second half of the sixteenth century, and Frobisher and Davis also visited the strait.

May 1, 1769.—Opening up Kentucky

Daniel Boon, a typical backwoodsman, keen on hunting and exploration, left his home in North California, crossed the Alleghenies and the Cumberland Mountains, and reached the fertile but forest-clad plain of Kentucky. He was captured by Indians, but made his escape, and later settled with his family in the region, which was soon visited by other surveying parties.

May 2, 1497.—John Cabot

The *Matthew*, commanded by John Cabot, a Genoese who became a naturalised citizen of Venice and later settled in England, sailed from Bristol. With a crew of 18 he crossed the North Atlantic and discovered land thought by some to be Cape Breton Island, by others to be southern Labrador or Newfoundland or Nova Scotia. In any event, Cabot did not realise that he had approached the shores of America, but thought that the land was part of the coast of north-east Asia. His son, Sebastian, after sailing in a Spanish expedition from Seville which reached the river La Plata in 1527, returned to England. He afterwards became director of the Company of Merchant Venturers, incorporated on Dec. 18, 1551, and in that capacity helped to organise the expedition of Willoughby and Chancellor.

May 3, 1850.—Sledge Travel in the Arctic

Capt. H. Austin sailed with two ships to search for Sir John Franklin via the Barrow Strait. Austin and Penny, a whaling captain, entered Barrow Strait and discovered Franklin's winter quarters of 1845–46, but no record of the direction taken by the ships. Austin and M'Clintock advanced to Melville Island, marching more than 770 miles in 80 days. Austin also examined the entrance to Jones Sound. The expedition is